

In the Claims

Claims 1-4 (canceled)

5. (currently amended) A DNA fragment comprising a nucleic acid sequence according to ~~claim 1-4~~ claim 25.
6. (currently amended) ~~Recombinant~~ A recombinant DNA molecule comprising a nucleic acid sequence according to ~~claims 1-4~~ or a DNA fragment according to claim 5 claim 25, under the control of a functionally linked promoter.
7. (currently amended) ~~Live~~ A live recombinant carrier comprising a nucleic acid sequence according to ~~claims 1-4,~~ a DNA fragment according to claim 5 or a recombinant DNA molecule according to claim 6. claim 25.
8. (currently amended) ~~Host~~ A host cell comprising a nucleic acid sequence according to ~~claims 1-4, a DNA fragment according to claim 5, a recombinant DNA molecule according to claim 6 or a live recombinant carrier according to claim~~ 7 claim 25.

Claims 9-18 (canceled)

19. (currently amended) ~~Vaccine~~ A vaccine for combating *Brachyspira hyodysenteriae* infection, ~~characterized in that it comprises~~ comprising antibodies against a lipoprotein according to ~~claims 9-14 or an immunogenic fragment of said lipoprotein~~ claim 29, and a pharmaceutically acceptable carrier.
20. (currently amended) ~~Vaccine~~ The vaccine according to claim 19, ~~characterized in that it comprises~~ comprising an adjuvant.
21. (currently amended) ~~Vaccine~~ The vaccine according to claim 19, ~~or 20, characterized in that it comprises~~ comprising an additional antigen derived from a ~~virus or micro-organism pathogenic to pigs~~ another swine pathogen, an antibody against such an antigen or genetic information encoding said antigen.
22. (currently amended) ~~Vaccine~~ The vaccine according to claim 21, ~~characterized in that said virus or micro-organism pathogenic to pigs~~ wherein said pathogen is selected from

the group consisting of Pseudorabies virus, Porcine influenza virus, Porcine parvo virus, Transmissible gastro-enteritis virus, Rotavirus, *Escherichia coli*, *Erysipelothrasiopathiae*, *Bordetella bronchiseptica*, *Salmonella cholerasuis*, *Haemophilus parasuis*, *Pasteurella multocida*, *Streptococcus suis*, *Mycoplasma hyopneumoniae* and *Actinobacillus pleuropneumoniae*.

Claim 23 (cancel)

24. (currently amended) A diagnostic kit for detecting *Brachyspira hyodysenteriae* or antibodies thereto, comprising ~~suitable detection means and~~ a nucleic acid sequence according to ~~claims 1-4 or a or primer thereof~~ claim 25, or a lipoprotein or ~~immunogenic~~ antigenic fragment thereof ~~according to claims 9-14 encoded by said sequence~~, or antibodies that are reactive with a said lipoprotein ~~according to claims 9-14~~.

25. (new) A nucleic acid sequence encoding an immunogenic 61kD *Brachyspira hyodysenteriae* lipoprotein, as measured by SDS-PAGE.

26. (new) The nucleic acid sequence of claim 25, wherein the 61 kD *Brachyspira hyodysenteriae* lipoprotein has the amino acid sequence of SEQ ID NO:2.
27. (new) A nucleic acid sequence encoding an immunogenic 20 kD *Brachyspira hyodysenteriae* lipoprotein, as measured by SDS-PAGE.
28. (new) The nucleic acid sequence of claim 27, wherein the 20 kD *Brachyspira hyodysenteriae* lipoprotein has the amino acid sequence of SEQ ID NO:4.
29. (new) An isolated immunogenic *Brachyspira hyodysenteriae* lipoprotein of 61 kD, as measured by SDS-PAGE.
30. (new) The isolated immunogenic *Brachyspira hyodysenteriae* lipoprotein of claim 29 having the amino acid sequence of SEQ ID NO: 2.
31. (new) An isolated immunogenic *Brachyspira hyodysenteriae* lipoprotein of 20 kD, as measured by SDS-PAGE.
32. (new) The isolated immunogenic *Brachyspira hyodysenteriae* lipoprotein of claim 31 having the amino acid sequence of SEQ ID NO:4.

33. (new) An immunogenic composition comprising an effective amount of the *Brachyspira hyodysenteriae* lipoprotein of claim 29 and a pharmaceutically acceptable carrier.
34. (new) An immunogenic composition comprising an effective amount of the *Brachyspira hyodysenteriae* lipoprotein of claim 31 and a pharmaceutically acceptable carrier.
35. (new) An immunogenic composition comprising an immunogenically effective amount of a nucleic acid sequence selected from the group consisting of a DNA fragment, a recombinant DNA molecule and a live recombinant carrier, or host cell comprising said nucleic acid sequence, wherein said nucleic acid sequence is the nucleic acid sequence of claim 25.
36. (new) An immunogenic composition comprising an immunogenically effective amount of a nucleic acid sequence selected from the group consisting of a DNA fragment, a recombinant DNA molecule and a live recombinant carrier, or a host cell comprising said nucleic sequence, wherein said nucleic acid sequence is the nucleic acid sequence of claim 27.

37. (new) A DNA fragment comprising a nucleic acid sequence according to claim 27.
38. (new) A recombinant DNA molecule comprising a nucleic acid sequence according to claim 27, under the control of a functionally linked promoter.
39. (new) A live recombinant carrier comprising a nucleic acid sequence according to claim 27.
40. (new) A host cell comprising a nucleic acid sequence according to claim 27.
41. (new) A diagnostic kit for detecting *Brachyspira hyodysenteriae* or antibodies thereto, comprising a nucleic acid sequence according to claim 27, or a lipoprotein or antigenic fragment thereof encoded by said sequence, or antibodies that are reactive with said lipoprotein.
42. (new) A vaccine for combating *Brachyspira hyodysenteriae* infection, comprising antibodies against a lipoprotein according to claim 31 and a pharmaceutically acceptable carrier.

43. (new) The vaccine according to claim 42, comprising an adjuvant.
44. (new) The vaccine according to claim 42, comprising an additional antigen derived from another swine pathogen, an antibody against such an antigen or genetic information encoding said antigen.
45. (new) The vaccine according to claim 44, wherein said pathogen is selected from the group constituting of Pseudorabies virus, Porcine influenza virus, Porcine parvo virus, Transmissible gastro-enteritis virus, Rotavirus, *Escherichia coli*, *Erysipelo rhusiopathiae*, *Bordetella bronchiseptica*, *Salmonella cholerasuis*, *Haemophilus parasuis*, *Pasteurella multocida*, *Streptococcus suis*, *Mycoplasma hyopneumoniae* and *Actinobacillus pleuropneumoniae*.